The CRUSHED STONE JOURNAL

PUBLISHED QUARTERLY

In This Issue

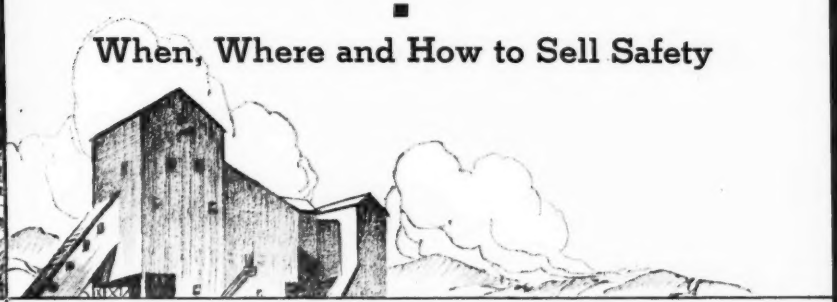
The National Crushed Stone Association Safety Competition of 1943

Victory in Safe Quarry Operations

How the General Crushed Stone Company Effectively Promotes Accident Prevention

The Postwar Outlook for Business and Labor

When, Where and How to Sell Safety



September · 1944

Official Publication
NATIONAL CRUSHED STONE ASSOCIATION

Technical Publications

of the

National Crushed Stone Association, Inc.

◈

BULLETIN No. 1

The Bulking of Sand and Its Effect on Concrete

BULLETIN No. 2

Low Cost Improvement of Earth Roads with Crushed Stone

BULLETIN No. 3

The Water-Ratio Specification for Concrete and Its Limitations

BULLETIN No. 4

"Retreading" Our Highways

BULLETIN No. 5

Reprint of "Comparative Tests of Crushed Stone and Gravel Concrete in New Jersey" with Discussion

BULLETIN No. 6

The Bituminous Macadam Pavement

BULLETIN No. 7

Investigations in the Proportioning of Concrete for Highways

BULLETIN No. 8

The Effect of Transportation Methods and Costs on the Crushed Stone, Sand and Gravel, and Slag Industries

BULLETIN No. 9

Tests for the Traffic Durability of Bituminous Pavements

BULLETIN No. 10

Stone Sand

BULLETIN No. 11

A Method for Proportioning Concrete for Compressive Strength, Durability and Workability

Single copies of the above bulletins are available upon request.

Manual of Uniform Cost Accounting Principles and Procedure for the Crushed Stone Industry ($2.00 per copy)

The Crushed Stone Journal

Official Publication of the NATIONAL CRUSHED STONE ASSOCIATION

J. R. BOYD, Editor

NATIONAL CRUSHED STONE ASSOCIATION

1735 14th St., N. W.
Washington 9, D. C.

OFFICERS

F. O. EARNSHAW, President
WM E. HILLIARD, Treasurer
J. R. BOYD, Administrative Director
A. T. GOLDBECK, Engineering Director
E. W. BAUMAN, Field Engineer

REGIONAL VICE PRESIDENTS

A. J. CAVIA — F. W. SCHMIDT, JR.
T. C. COOKE — W. C. SPARKS
PAUL M. NAUMAN — A. J. WILSON
W. T. RAGLAND — W. F. WISE

EXECUTIVE COMMITTEE

F. O. EARNSHAW, Chairman
WM. M. ANDREWS — OTHO M. GRAVES
G. A. AUSTIN — RUSSELL RAREY
L. J. BOXLEY — W. F. WISE
A. L. WORTHEN

Contents

Page

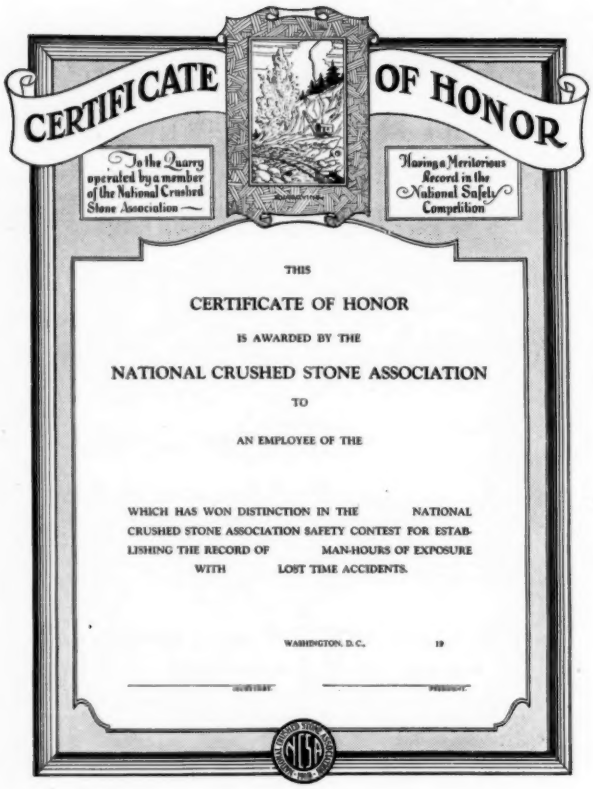
The National Crushed Stone Association Safety Competition of 1943
—T. D. Lawrence and J. I. Davis - 3

Victory in Safe Quarry Operations
—E. J. Ball - - - - - - - - - - 8

How the General Crushed Stone Company Effectively Promotes Accident Prevention
—H. F. Yotter - - - - - - - - - 11

The Postwar Outlook for Business and Labor
—Sumner H. Schlichter - - - - - - 13

When, Where and How to Sell Safety
—W. M. Powell - - - - - - - - - 17


CERTIFICATE OF HONOR
To the Quarry operated by a member of the National Crushed Stone Association
Having a Meritorious Record in the National Safety Competition
THIS
CERTIFICATE OF HONOR
IS AWARDED BY THE
NATIONAL CRUSHED STONE ASSOCIATION
TO
AN EMPLOYEE OF THE
WHICH HAS WON DISTINCTION IN THE NATIONAL CRUSHED STONE ASSOCIATION SAFETY CONTEST FOR ESTABLISHING THE RECORD OF MAN-HOURS OF EXPOSURE WITH LOST TIME ACCIDENTS.
WASHINGTON, D.C., 19

THIS Certificate of Honor will be presented to each employee of each plant which completed the year 1943 with no lost time accidents.

THE
CRUSHED STONE JOURNAL

WASHINGTON, D. C.

Vol. XIX No. 3 PUBLISHED QUARTERLY SEPTEMBER, 1944

The National Crushed Stone Association Safety Competition of 1943

By T. D. LAWRENCE and
J. I. DAVIS

Under supervision of W. W. Adams, Chief, Accident Analysis Division, Economics and Statistics Service, U. S. Bureau of Mines.

• Bessemer limestone quarry of the Bessemer Limestone and Cement Company wins first place. Second and third position go to the Le-Roy limestone quarry and the Rock Hill trap rock quarry, both of the General Crushed Stone Company. Seven additional plants receive Honorable Mention for accident free records.

ELEVEN out of 34 plants that participated in an accident-prevention contest among quarry and crushed-stone operations during 1943 were operated during the contest year without a lost-time or disabling injury among the workers, according to an examination of reports furnished by operating companies to the Bureau of Mines, United States Department of the Interior. The contest of 1943 was the 18th yearly competition conducted by the Bureau of Mines, in cooperation with the National Crushed Stone Association, for the promotion of safety among workers in the crushed-stone industry. In addition to the 34 plants, all of which were open quarries, 5 underground quarries or mines were enrolled in the contest; none of these, however, were free of accidents during the year. The 39 open quarries and underground mines were operated in 15 States, as follows: California, Connecticut, Illinois, Iowa, Maryland, Massachusetts, Michigan, Missouri, New York, Oklahoma, Pennsylvania, South Carolina, Texas, Virginia, and West Virginia.

In accordance with the rules under which the safety contest is conducted, a trophy, provided by the EXPLOSIVES ENGINEER magazine, is awarded to the plant that establishes the best safety record, by which is meant the record that shows the fewest days of disability caused by accidents among the employees in proportion to the total number of man-hours worked by all employees at the plant during the year. If two or more plants have no accidents, the best record is that which shows the largest number of man-hours worked.

The winner of the safety trophy for 1943 was the Bessemer limestone quarry, operated by The Bessemer Limestone & Cement Company, at Bessemer, Lawrence County, Pa. This quarry was operated for 368,483 man-hours during 1943 without a disabling injury to an employee. The safety trophy won by the Bessemer quarry is a bronze plaque on which is portrayed in bas-relief the quarry scene on the pedestal of the "Sentinels of Safety" trophy awarded in the Bureau of Mines National Safety Competition.

In addition to the trophy, each plant, other than the trophy winner, that operates throughout the year with an accident-free record receives honorable mention and is awarded a parchment reproduction of the quarry scene on the bronze plaque. Each employee of the plants with accident-free records is presented with a Certificate of Honor. The trophy, parchment reproductions, and certificates are usually presented at the annual convention of the National Crushed Stone Association.

TABLE 1

RELATIVE STANDING OF QUARRIES IN THE 1943 NATIONAL CRUSHED STONE ASSOCIATION SAFETY COMPETITION, BASED UPON THE ACCIDENT-SEVERITY RATES OF THE QUARRIES[1]

Code No.	Group No.	Man-hours worked	Number of injuries[2]					Average days of disability per temp. injury	Number of days of disability[2]					Frequency rate[3]	Severity rate[3]
			F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	1	363,433	—	—	—	—	—	—	—	—	—	—	—	0.000	0.000
2	2	99,104	—	—	—	—	—	—	—	—	—	—	—	.000	.000
3	3	89,374	—	—	—	—	—	—	—	—	—	—	—	.000	.000
4	4	81,343	—	—	—	—	—	—	—	—	—	—	—	.000	.000
5	5	68,197	—	—	—	—	—	—	—	—	—	—	—	.000	.000
6	6	53,132	—	—	—	—	—	—	—	—	—	—	—	.000	.000
7	7	48,966	—	—	—	—	—	—	—	—	—	—	—	.000	.000
8	8	37,736	—	—	—	—	—	—	—	—	—	—	—	.000	.000
9	9	37,019	—	—	—	—	—	—	—	—	—	—	—	.000	.000
10	10	29,350	—	—	—	—	—	—	—	—	—	—	—	.000	.000[4]
11	11	10,248	—	—	—	—	—	—	—	—	—	—	—	.000	.000
12	12	133,842	—	—	—	1	1	3	—	—	—	3	3	7.471	.022
13	13	62,382	—	—	—	1	1	14	—	—	—	14	14	16.030	.224
14	14	122,862	—	—	—	1	1	59	—	—	—	59	59	8.139	.480
16	15	202,654	—	—	—	9	9	13	—	—	—	116	116	44.411	.572
17	16	170,672	—	—	—	4	4	26	—	—	—	105	105	23.437	.615
18	17	112,906	—	—	—	3	3	24	—	—	—	71	71	26.571	.629
19	18	197,693	—	—	—	9	9	15	—	—	—	138	138	45.525	.693
20	19	154,643	—	—	—	4	4	33	—	—	—	133	133	25.866	.860
21	20	62,847	—	—	—	1	1	64	—	—	—	64	64	15.912	1.018
22	21	202,417	—	—	—	7	7	32	—	—	—	221	221	34.582	1.092
24	22	152,085	—	—	—	1	1	198	—	—	—	198	198	6.575	1.302
25	23	73,390	—	—	—	3	3	36	—	—	—	107	107	40.878	1.458
26	24	310,998	—	—	—	32	32	15	—	—	—	480	480	102.895	1.543
27	25	46,852	—	—	—	2	2	43	—	—	—	85	85	42.688	1.814
29	26	20,383	—	—	—	1	1	54	—	—	—	54	54	49.060	2.649
30	27	44,262	—	—	—	5	5	29	—	—	—	147	147	112.964	3.321
32	28	90,875	—	—	1	1	2	12	—	—	396	12	408	22.008	4.490
33	29	755,403	1	—	—	11	12	18	6,000	—	—	195	6,195	15.886	8.201
34	30	51,783	—	—	—	3	3	229	—	—	—	687	687	57.934	13.267
35	31	369,389	1	—	—	9	10	25	6,000	—	—	227	6,227	27.072	16.858
36	32	361,005	2	—	2	19	23	30	12,000	—	1,050	577	13,627	63.711	37.747
37	33	107,634	—	—	1	6	7	13	—	—	4,500	79	4,579	65.035	42.542
39	34	20,385	—	—	1	1	2	90	—	—	1,200	90	1,290	98.111	63.282
Totals and rates, 1943		4,750,314	4	0	5	134	143	29	24,000	0	7,146	3,862	35,008	30.103	7.370
Totals and rates, 1942		7,178,935	3	2	1	183	189	23	18,000	12,000	1,500	4,239	35,739	26.327	4.978

[1] As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

[2] F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

[3] Frequency rate indicates the number of fatal, permanent, and other disabling injuries per million man-hours of exposure; severity rate indicates number of days of disability lost from injuries per thousand man-hours of exposure.

[4] Ineligible for award.

TABLE 2

RELATIVE STANDING OF UNDERGROUND MINES IN THE 1943 NATIONAL CRUSHED STONE ASSOCIATION SAFETY COMPETITION, BASED UPON THE ACCIDENT-SEVERITY RATES OF THE MINES[1]

Code No.	Group No.	Man-hours worked	Number of injuries[2]					Average days of disability per temp. injury	Number of days of disability[2]					Frequency rate[3]	Severity rate[3]
			F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
15	1	297,167	—	—	—	5	5	34	—	—	—	169	169	16.826	0.569
23	2	119,544	—	—	—	6	6	24	—	—	—	144	144	50.191	1.205
28	3	280,058	—	—	—	17	17	30	—	—	—	516	516	60.702	1.842
31	4	237,198	—	—	1	9	10	19	—	—	750	171	921	42.159	3.883
38	5	85,804	—	—	2	8	10	15	—	—	4,200	123	4,323	116.545	50.382
Totals and rates, 1943		1,019,771	—	—	3	45	48	25	—	—	4,950	1,123	6,073	47.069	5.955
Totals and rates, 1942		785,894	—	—	1	33	34	37	—	—	1,800	1,213	3,013	43.263	3.834

[1] See footnotes 1, 2, and 3, Table 1.

TABLE 3

YEARLY SUMMARY—OPEN QUARRIES IN THE NATIONAL CRUSHED STONE ASSOCIATION SAFETY COMPETITION, 1926-43

Year	Plants	Man-hours worked	Number of injuries[1]					Number of days of disability[1]					Frequency rate[2]	Severity rate[2]
			Fatal	P.T.	P.P.	Temp.	Total	Fatal	P.T.	P.P.	Temp.	Total		
1925[3]	38	4,927,402	4	——	3	292	299	24,000	——	3,600	5,286	32,886	60.681	6.674
1926	40	5,298,983	3	——	6	207	216	18,000	——	9,000	4,239	31,239	40.763	5.895
1927	48	7,876,791	9	——	2	458	469	54,000	——	2,100	7,186	63,286	59.542	8.034
1928	53	7,509,098	8	——	4	322	334	48,000	——	8,700	5,493	62,193	44,479	8.282
1929	53	7,970,325	4	——	5	286	295	24,000	——	5,760	5,533	35,293	37.012	4.428
1930	68	8,013,415	6	——	9	227	242	36,000	——	7,250	3,671	46,921	30.199	5.855
1931	58	5,085,857	4	——	13	198	215	24,000	——	18,660	3,540	46,200	42.274	9.084
1932	40	2,661,850	1	——	4	75	80	6,000	——	6,750	2,481	15,231	30.054	5.722
1933	40	2,704,871	1	——	1	67	69	6,000	——	48	2,893	8,941	25.510	3.306
1934	46	3,288,257	1	——	2	106	109	6,000	——	2,850	1,873	10,723	33.148	3.261
1935	46	4,166,306	2	1	8	77	88	12,000	6,000	9,900	3,015	30,915	21.122	7.420
1936	50	6,399,023	5	——	14	182	201	30,000	——	8,168	4,590	42,758	31.411	6.682
1937	47	6,199,001	7	——	9	136	152	42,000	——	5,875	4,461	52,336	24.520	8.443
1938	47	4,658,119	2	——	6	76	84	12,000	——	6,600	3,184	21,784	18.033	4.677
1939	44	4,219,086	2	——	2	51	55	12,000	——	4,800	1,678	18,478	13.036	4.380
1940	46	4,358,409	1	——	5	78	84	6,000	——	2,550	3,013	11,563	19.273	2.653
1941	47	5,777,587	3	——	5	98	106	18,000	——	9,300	2,266	29,566	18.347	5.117
1942	48	7,178,935	3	2	1	183	189	18,000	12,000	1,500	4,239	35,739	26.327	4.978
1943	34	4,750,314	4	——	5	134	143	24,000	——	7,146	3,862	35,008	30.103	7.370
Total 1926-43 —		98,116,227	66	3	101	2,961	3,131	396,000	18,000	116,957	67,217	598,174	31.911	6.097
Total 1925-43 —		103,043,629	70	3	104	3,253	3,430	420,000	18,000	120,557	72,503	631,060	33.287	6.124

[1] See footnotes 1 and 2, Table 1.

[3] The National Crushed Stone Association Safety Competition began in 1926; figures for 1925 for company members are given for comparison.

TABLE 4

YEARLY SUMMARY—UNDERGROUND MINES IN THE NATIONAL CRUSHED STONE ASSOCIATION SAFETY COMPETITION, 1926-43

Year	Plants	Man-hours worked	Number of injuries[1]					Number of days of disability[1]					Frequency rate[2]	Severity rate[2]
			Fatal	P.T.	P.P.	Temp.	Total	Fatal	P.T.	P.P.	Temp.	Total		
1925[3]	3	400,672	—	—	—	29	29	——	——	——	228	228	72.378	0.569
1926	3	517,926	—	—	—	34	34	——	——	——	533	533	65.646	1.029
1927	2	318,449	1	—	1	14	16	6,000	——	300	68	6,368	50.244	19.997
1928	5	542,193	1	—	1	68	70	6,000	——	300	888	7,188	129.105	13,257
1929	4	665,520	1	—	1	30	32	6,000	——	300	617	6,917	48.083	10.393
1930	6	595,367	1	—	1	15	17	6,000	——	225	468	6,693	28.554	11.242
1931	3	345,105	—	—	—	4	4	——	——	——	147	147	11.591	.426
1932	2	158,450	—	—	—	6	6	——	——	——	165	165	37.867	1.041
1933	3	229,381	—	—	—	11	11	——	——	——	349	349	47.955	1.521
1934	4	248,145	—	—	—	13	13	——	——	——	287	287	52.389	1.157
1935	2	175,994	—	—	—	3	3	——	——	——	249	249	17.046	1.415
1936	4	334,747	1	—	—	7	8	6,000	——	——	117	6,117	23.899	18.274
1937	3	364,680	—	—	—	3	3	——	——	——	91	91	8.226	.250
1938	3	334,442	—	—	—	2	2	——	——	——	133	133	5.980	.398
1939	4	393,039	—	—	1	7	8	——	——	600	457	1,057	20.354	2.689
1940	4	275,987	—	—	1	8	9	——	——	4,500	888	5,388	23.737	14.330
1941	4	591,568	—	—	1	15	16	——	——	750	169	919	27.047	1.553
1942	4	785,894	—	—	1	33	34	——	——	1,800	1,213	3,013	43.263	3.834
1943	5	1,019,771	—	—	3	45	48	——	——	4,950	1,123	6,073	47.069	5.955
Total 1926-43 —		7,996,659	5	0	11	318	334	30,000	0	13,725	7,962	51,687	41.767	6.464
Total 1925-43 —		8,397,331	5	0	11	347	363	30,000	0	13,725	8,190	51,915	43.228	6.182

[1] See footnotes 1 and 2, Table 1.

[3] The National Crushed Stone Association Safety Competition began in 1926; figures for 1925 for company members are given for comparison.

TABLE 5

YEARLY SUMMARY—OPEN QUARRIES AND UNDERGROUND MINES IN THE NATIONAL CRUSHED STONE ASSOCIATION SAFETY COMPETITION, 1926-43

Year	Plants	Man-hours worked	Number of injuries[1]					Number of days of disability[1]					Frequency rate[2]	Severity rate[2]
			Fatal	P.T.	P.P.	Temp.	Total	Fatal	P.T.	P.P.	Temp.	Total		
1925[3]	41	5,328,074	4	——	3	321	328	24,000	——	3,600	5,514	33,114	61.561	6.215
1926	43	5,816,909	3	——	6	241	250	18,000	——	9,000	4,772	31,772	42.978	5.462
1927	50	8,195,240	10	——	3	472	485	60,000	——	2,400	7,254	69,654	59.181	8.499
1928	58	8,051,291	9	——	5	390	404	54,000	——	9,000	6,381	69,381	50.178	8.617
1929	57	8,635,845	5	——	6	316	327	30,000	——	6,060	6,150	42,210	37.865	4.888
1930	74	8,608,782	7	——	10	242	259	42,000	——	7,475	4,139	53,614	30.086	6.228
1931	61	5,430,962	4	——	13	202	219	24,000	——	18,660	3,687	46,347	40.324	8.534
1932	42	2,820,300	1	——	4	81	86	6,000	——	6,750	2,646	15,396	30.493	5.459
1933	43	2,934,252	1	——	1	78	80	6,000	——	48	3,242	9,290	27.264	3.166
1934	50	3,536,403	1	——	2	119	122	6,000	——	2,850	2,160	11,010	34.498	3.113
1935	48	4,342,300	2	1	8	80	91	12,000	6,000	9,900	3,264	31,164	20.957	7.177
1936	54	6,733,770	6	——	14	189	209	36,000	——	8,168	4,707	48,875	31.038	7.258
1937	50	6,563,681	7	——	9	139	155	42,000	——	5,875	4,552	52,427	23.615	7.987
1938	50	4,992,561	2	——	6	78	86	12,000	——	6,600	3,317	21,917	17.226	4.390
1939	48	4,612,125	2	——	3	58	63	12,000	——	5,400	2,135	19,535	13.660	4.236
1940	50	4,734,396	1	——	6	86	93	6,000	——	7,050	3,901	16,951	19.643	3.580
1941	51	6,369,155	3	——	6	113	122	18,000	——	10,050	2,435	30,485	19.155	4.786
1942	52	7,964,829	3	2	2	216	223	18,000	12,000	3,300	5,452	38,752	27.998	4.865
1943	39	5,770,085	4	——	8	179	191	24,000	——	12,096	4,985	41,081	33.102	7.120
Total 1926-43	—	106,112,886	71	3	112	3,279	3,465	444,000	18,000	130,682	75,179	649,861	32.654	6.124
Total 1925-43	—	111,440,960	75	3	115	3,600	3,793	450,000	18,000	134,282	80,693	682,975	34.036	6.129

[1] See footnote 1 and 2, Table 1.

[2] The National Crushed Stone Association Safety Competition began in 1926; figures for 1925 for company members are given for comparison.

TABLE 6

NUMBER OF INJURIES, BY CAUSES, AT QUARRIES AND UNDERGROUND MINES IN THE NATIONAL CRUSHED STONE ASSOCIATION SAFETY COMPETITION IN 1943.

Cause	Fatal	Permanent Total	Permanent Partial	Tempo-rary	Total
Falls and slides of rock	—	—	1	21	22
Handling materials or objects	—	—	—	10	10
Hand tools	—	—	—	19	19
Explosives	—	—	—	—	—
Haulage	1	—	2	18	21
Falls of persons	—	—	—	24	24
Bumping against objects	—	—	—	3	3
Falling objects	—	—	—	12	12
Flying objects or particles	—	—	2	13	15
Electricity	—	—	—	7	7
Drilling	—	—	—	5	5
Machinery	2	—	3	18	23
Steppong on objects	—	—	—	6	6
Burns	—	—	—	4	4
Other causes	—	—	—	5	5
Total	3	—	8	165	176
Not stated	1	—	—	14	15
Grand total	4	—	8	179	191

Nine plants were awarded honorable mention for operating throughout the year without a lost-time or disabling injury to an employee. These plants are as follows:

1. LeRoy limestone quarry, LeRoy, Genesee County, N. Y., operated by General Crushed Stone Co., worked 99,104 man-hours;

2. Rock Hill trap-rock quarry, Quakertown, Bucks County, Pa. operated by General Crushed Stone Co., worked 89,374 man-hours;

TABLE 7

DAYS OF DISABILITY BY CAUSES OF INJURIES AT QUARRIES AND UNDERGROUND MINES IN THE NATIONAL CRUSHED STONE ASSOCIATION SAFETY COMPETITION IN 1943.

Cause	Fatal	Permanent Total	Permanent Partial	Tempo-rary	Total
Falls and slides of rock	—	—	2,400	856	3,256
Handling materials or objects	—	—	—	435	435
Hand tools	—	—	—	346	346
Explosives	—	—	—	—	—
Haulage	6,000	—	5,250	896	12,146
Falls of persons	—	—	—	771	771
Bumping against objects	—	—	—	23	23
Falling objects	—	—	—	311	311
Flying objects or particles	—	—	2,196	155	2,351
Electricity	—	—	—	42	42
Drilling	—	—	—	77	77
Machinery	12,000	—	2,250	257	14,507
Stepping on objects	—	—	—	93	93
Burns	—	—	—	35	35
Other causes	—	—	—	96	96
Total	18,000	—	12,096	4,393	34,489
Not stated	6,000	—	—	592	6,592
Grand total	24,000	—	12,096	4,985	41,081

TABLE 8

AVERAGE DAYS OF DISABILITY PER TEMPORARY INJURY AT PLANTS ENROLLED IN THE NATIONAL CRUSHED STONE ASSCOCIATION SAFETY COMPETITION

	Underground mines			Open Quarries			Total		
Year	No. of temporary injuries	No. of days of disability	Av. days of disability	No. of temporary injuries	No. of days of disability	Av. days of disability	No. of temporary injuries	No. of days of disability	Av. days of disability
1925	29	288	8	202	5,286	18	321	5,514	17
1926	34	533	16	207	4,239	20	241	4,772	20
1927	14	68	5	458	7,186	16	472	7,254	15
1928	68	888	13	322	5,493	17	390	6,381	16
1929	30	617	21	286	5,533	19	316	6,150	19
1930	15	468	31	227	3,671	16	242	4,139	17
1931	4	147	37	198	3,540	18	202	3,687	18
1932	6	165	28	75	2,481	33	81	2,646	33
1933	11	349	32	67	2,893	43	78	3,242	42
1934	13	287	22	106	1,873	18	119	2,160	18
1935	3	249	83	77	3,015	39	80	3,264	41
1936	7	117	17	182	4,590	25	189	4,707	25
1937	3	91	30	136	4,461	33	139	4,552	33
1938	2	133	67	76	3,184	42	78	3,317	43
1939	7	457	65	51	1,678	33	58	2,135	37
1940	8	888	111	78	3,013	39	86	3,901	45
1941	15	169	11	98	2,266	23	113	2,435	22
1942	33	1,213	37	183	4,239	23	216	5,452	25
1943	45	1,123	25	134	3,862	29	179	4,985	28
Total	347	8,190	24	3,253	72,503	22	3,600	80,693	22

3. Oglesby limestone quarry, Oglesby, La Salle County, Ill., operated by Marquette Cement Manufacturing Co., worked 81,343 man-hours;

4. Marquette limestone quarry, Cape Girardeau, Cape Girardeau County, Mo., operated by Marquette Cement Mfg. Co., worked 68,197 man-hours;

5. White Haven sandstone quarry, White Haven, Luzerne County, Pa., operated by General Crushed Stone Co., worked 53,132 man-hours;

6. Catskill limestone quarry, Catskill, Greene County, N. Y., operated by North American Cement Corporation, worked 48,966 man-hours;

7. Plainville No. 4 trap-rock quarry, Plainville, Hartford County, Conn., operated by New Haven Trap Rock Co., worked 37,736 man-hours;

8. Jordanville limestone quarry, Jordanville, Herkimer County, N. Y., operated by General Crushed Stone Co., worked 37,019 man-hours;

9. Granby No. 5 trap-rock quarry, Granby, Hartford County, Conn., operated by New Haven Trap Rock Co., worked 10,248 man-hours.

The 39 plants—34 open quarries and 5 underground mines—that participated in the 1943 contest worked 5,770,085 man-hours, an average of 147,951 man-hours

(*Continued on page 10*)

TABLE 9

EMPLOYMENT AND ACCIDENT DATA FOR OPEN QUARRIES AND UNDERGROUND MINES ENROLLED IN THE NATIONAL CRUSHED STONE ASSOCIATION SAFETY COMPETITION, 1942 and 1943, COVERING IDENTICAL PLANTS

	No. of plants	Man-hours worked	Number of injuries					Days of Disability					Frequency rate	Severity rate
			F.	P.T.	P.P.	Temp.	Total	F.	P.T.	P.P.	Temp.	Total		
Plants enrolled in 1942 only	13	2,259,797	1	1	—	56	58	6,000	6,000	—	1,621	13,621	25.666	6.028
Identical plants, enrolled both years, 1942	35	5,368,544	1	1	2	160	164	6,000	6,000	3,300	3,475	18,775	30.548	3.497
Indentical plants, enrolled both years, 1943	35	5,361,257	4	—	8	164	176	24,000	—	12,096	4,703	40,799	32.828	7.610
Plants enrolled in 1943 only	4	408,828	—	—	—	15	15	—	—	—	282	282	36.690	.690

Victory in Safe Quarry Operations

By E. J. BALL

Safety Director, The Bessemer Limestone and Cement Co., Youngstown, Ohio.

• The Bessemer limestone quarry of The Bessemer Limestone and Cement Company won the N. C. S. A. Safety Contest for last year with the remarkable record of 368,433 man-hours with no lost-time accidents. In the following article there is described the essential characteristics of their accident prevention program.

THE Bessemer Limestone and Cement Company owns and operates quite extensive properties in and around the vicinity of Bessemer, Lawrence County, Pennsylvania, with our Main Office located in Youngstown, Ohio. Our name accurately describes our products.

The Company started operations on the present site in the year 1887 under the name of Bessemer Limestone Company, producing limestone exclusively. In 1901 the Company entered the brick business; two large plants were constructed and operated until 1917, at which time they were sold to other interests. In 1920 a modern cement plant was built to take care of the ever growing demand for Portland Cement. At this period the name was changed to its present title. The Company has had a healthy growth from the days when stone was all loaded by hand labor up until today when this same work is done by a modern electric shovel. Progress has always been the theme of our Company as it has never failed to keep apace with developments in the stone and cement industries. Whenever new and more efficient equipment for the manufacture of our product was developed it has in most cases been adopted.

This latter statement is true in accident prevention also, and has been emphasized much more since we joined with the cement industry.

Through the years of our existence a great many unfortunate accidents have occurred and we often think how many of these accidents could have been prevented had safety been emphasized then as it is today. No doubt, many accidents could have been prevented but those opportunities have passed; we now live for today and hoping for tomorrow that history will not repeat itself.

Space will not permit full details of all our safety activities, but the following paragraphs will give fairly well a wide scope of our Safety work.

Our stone department boys really scored a major victory over "old man accident" during 1943. This was accomplished in spite of the fact of a heavy increase in production and consequently a corresponding increase in man-hours. Each one of our workmen is to be congratulated for the part he played in making this record possible.

It will have to be admitted that this record was not an easy accomplishment but instead a long hard battle with some very "close shaves." This latter statement is for the benefit of any quarry safety committee that thinks there might be an easy way to safety. It takes continuous supervision and inspection and then you are not always sure.

Our safety organization is not very elaborate and we function under a permanent plant committee which comprises our foremen. The Union also appoints one of their members who meets with the plant committee at our regularly scheduled safety meetings.

In 1943, we held two safety meetings a month. One meeting was the permanent plant committee and the Union representative. Our meetings were usually one hour in length. This time was used to discuss our problems, make recommendations and to study our own experience and the unfortunate experiences of other plants.

The second meeting was a foremen's meeting only. This time was allotted to foremanship and accident prevention. These meetings were held in conference style with each man urged to participate and give his own views. The supporting literature we used came from the National Safety Council and other agencies interested in the safety movement.

We have always stressed in our foremen meetings the important position they hold as leaders representing management on the production front; that it is to them that our men look for guidance not only in production but in safe production.

Telling a foreman he is responsible for the injuries that happen to his men will not solve any safety problem. He has to be not only sold on the idea but also has to be shown. The foreman must be educated before you can expect too much from the men under him. The willingness or unwillingness to accept this responsibility can either make or break any safety program.

In 1942, our Foremen were given the advantage of the Government's "Job Instructors Training Course." In 1943, we used foremanship courses and now in 1944, we are using slide-film to convey the message of safety, foremanship and first-aid. No one method seems to hold the answer for Safety; all seem necessary.

In addition to our meetings, the foremen and Union Safety representative are sent additional literature on different subjects on safety, also magazines featuring safety and special bulletins that appear from time to time. The theory of this is to keep safety in front of our leaders at all times so there will be no excuse for that old alibi, "I forgot".

Since many of our former employees are away to war, we, like other quarries, have taken on a number of new employees and some of them are not too young. This, of course, has created new problems for our foremen but they met the situation in 1943 and won.

A mass safety meeting is held once a year on June 1st for the start off of our June Campaign against accidents. It would be well if we could have more of these meetings but our men live over such a large territory it is difficult to have the off-shift workmen attend.

Should an accident occur, the foreman's first duty, of course, is to see that the injured is properly taken care of. Then, as soon as the foreman has made those arrangements, his next duty is to make an investigation of the accident using a special form to make this report.

THE BESSEMER LIMESTONE & CEMENT COMPANY PERMANENT PLANT SAFETY COMMITTEE

From Left to Right: PAUL NORD, IVAN HENDERSON, PAUL SNYDER, JOHN MACK, E. J. BALL, *Safety Director*, PAUL HOVIS, HENRY ZEH, WILBUR STANLEY, *General Quarry Foreman*, GEORGE BENSON.

The investigation and accident reports are turned over to the Safety Department where all the details are worked out and records kept. It should be stated that in serious accidents where lost-time is involved, the Safety Department and Superintendent make

HARRY E. REED, GENERAL SUPT.
BESSEMER LIMESTONE & CEMENT CO.
BESSEMER, PENNA.

further investigations in order to see if all the causes for the accident have been recorded.

Several years ago, when we started more detailed accident investigations, we found some of the employees reluctant to divulge some of the details fearing they might cause embarrassment to their fellow workman. This more or less disappeared when we sold them the idea that we were only trying to be helpful so that the unfortunate circumstances would not again occur and that we were not seeking out some one to blame and possibly discharge. Now, it is possible to get at the real cause in almost every accident.

We stress the unsafe practice of the employee himself as the chief cause of most injuries, and this, of course, brings back from the employee many suggestions on unsafe physical conditions. Some of these suggestions are trivial but most of them are constructive. We endeavor to correct any unsafe conditions as soon as possible.

The secret of our 1943 success has only come about by the splendid cooperation of Mr. G. G. Treat, President; Mr. R. E. Roscoe, Vice President in Charge of Operations; Mr. H. E. Reed, General Superintendent; our foremen and all the workmen under them.

Annual Safety Competition of 1943

(*Continued from page 7*)

per plant. Accidents to the employees caused deaths and nonfatal injuries, all of which represented a combined charge of 41,081 days of employee-disability. The accident-frequency rate for the 39 plants was 33.10 per million man-hours; the accident-severity rate was 7.12 per thousand man-hours.

In the open-quarry group the 34 plants had an accident-frequency rate of 30.10 and an accident-severity rate of 7.37. The 34 quarries operated 4,750,314 man-hours. The 5 underground mines operated 1,019,771 man-hours with an accident-frequency rate of 47.07 and an accident-severity rate of 5.96.

Fifty-one percent of the accidents for which the causes were revealed by the reports were caused by falls of persons, machinery, falls and slides of rock and haulage. These four causes also accounted for 89 percent of the days of disability. In classifying the accidents by causes, 15 accidents of a total of 191 could not be classified due to insufficient information.

Tables 1 and 2 show the relative standing of plants enrolled in the contest of 1943, arranged according to their accident-severity rates. When two or more plants have accident-free records, the number of man-hours worked governs the order. Tables 3 and 4 show yearly summary figures for all enrolled plants from 1926 to 1943, and for Association members for 1925, the year before the contests were organized. Table 5 shows a yearly summary covering both open quarries and underground mines that were enrolled in the contests. Tables 6 and 7 show the number of injuries by causes and days of disability by causes of injuries in 1943. Table 8 shows the average days of disability for temporary injuries at all plants enrolled in the contests. Table 9 gives employment and accident data for open quarries and underground mines enrolled in the competition during 1942 and 1943, covering identical plants.

How the General Crushed Stone Company Effectively Promotes Accident Prevention

By H. F. YOTTER

Safety Supervisor, The General Crushed Stone Company, Easton, Pa.

• Plants of The General Crushed Stone Company have for many years consistently taken honors in the Association's Safety Contest and therefore the following observations by Mr. Yotter are made from a background of specific accomplishment in the field of accident prevention.

ACCIDENT prevention is primarily a matter of organization and education. It is an essential part and an inevitable result of good management. It is so closely linked with other problems of management that effective effort on one will likewise affect the other. Our plan of accident prevention and self-insurance was conceived and instituted by the management of our company and ever since it has had the full support of our executive and operating heads.

Organizational Set-Up

In our company we have a General Safety Committee composed of the executive and operating heads of the company, whose function it is to direct and plan our program of safety. This committee's policies are transmitted to the plant superintendents and local safety committees through the medium of the safety supervisor, who regularly visits each plant. We have at each operation a safety committee made up of five or six of the key men, including the superintendent. This committee meets periodically with the safety supervisor, who presides at the meetings.

At these meetings is reviewed the accident experience of all of our plants since the previous meeting.

We have in effect an inspection report form covering some of the principal conditions at the operation, which form is used by the local committee in making its inspection of existing conditions. On these forms are recorded the result of the inspections and the ideas and recommendations of the members of the committee, and such suggestions are passed on at the committee meetings. General matters of safety are discussed and the members of the committee are expected to present suggestions with respect to unsafe conditions and the safety and health of the workers. Such ideas as are developed at these meetings are then passed on to the other workers by this representative committee.

The employer is morally obligated to see that his employes are enlightened as to the hazards of their occupation and to make sure that they are active in their efforts to avoid accidents. Management must lead the way and in a manner that the workers will be convinced of its sincerity. We must teach men to be alert in protecting themselves and those working with or near them. A workman who is wide awake and careful will not only achieve a good safety record but will be equally concerned about the quality of his workmanship. An efficient worker is the safest worker; the right way to perform a task is the safe way.

Superintendent Is Keyman

The prevention of accidents should be made the responsibility of the superintendent, just as he is held accountable for quantity, quality and cost of production, as safety bears a close relation to each of these operating phases. When the superintendent is convinced of the value of safety and is enthusiastic in preventing the men under his supervision from being hurt, considerable progress has been made in the program. If the superintendent is an effective leader and holds the respect of the men, as is very necessary, he is placed in excellent position to influence his men to acquire the habit of working carefully and in such manner as will prevent their being hurt. If the superintendent is held in high esteem by those in charge, they will look up to him and the confidence thus established will simplify and facilitate his work of educating them to safe-mindedness. Safety engineering is really human engineering and the best results can only be attained if the superintendent in charge can procure the sympathetic cooperation of every man at his plant.

Accurate Determination of Hazards Essential

A careful study of working conditions, a thorough analysis of accidents occurring under them, and a searching inquiry into potential causes of accidents that have not yet occurred affords an accurate picture of the hazards to which workmen are exposed and permits determination of the proper means of

forestalling or overcoming them. No remedy can be effective which is based upon a wrong diagnosis. It is manifestly of great importance that we profit by those accidents which do not involve injury to persons, as the difference between an accident without injury and one causing injury is sometimes only a matter of a split second or the fraction of an inch. The "narrow escapes" are well worth investigating.

Getting Men To Think "Safety"

Safety is a great and simple truth and its worthiness and merit are its strongest appeal. It is based upon sane, clear and careful reasoning. Safety is to get every man on the job to look over his ground in advance. In educating the workers it is highly desirable to teach and train them to be instinctively and habitually careful. Workers should become imbued with the safety habit. Getting men to think "Safety" and think it unconsciously is probably one of the most difficult tasks. The best safety device is a safe workman, and the safety device in a man's head is of greater value than the guard on the machine he is operating. A careful employee who knows how to speak safely would be less likely to be injured in a poorly arranged and unprotected plant than a careless and indifferent worker in a well-guarded plant.

The lower morale of workers as the result of the recent prolonged depression and the restlessness and tenseness resulting from the unsettled conditions created by the war has presented an additional problem in our industry. The manpower shortage existing the past few years has resulted in greater labor turnover and it has been necessary to employ some men of lower caliber and poorer physical condition than heretofore. This type of worker has presented a serious difficulty. Many of these men are so-called "drifters" and require greater and constant direction, as they have not worked sufficiently long at one location to have absorbed much safety training. Their poorer physical condition also constitutes an added hazard and it is essential that much care be exercised in placing them in jobs where their physical and mental handicaps will expose them to a minimum risk.

Self-Insurance Has Many Advantages

Our company assumed its own compensation risk through authorized and approved self-insurance in two states about sixteen years ago and has operated in this manner ever since. During this time we have carried Excess Insurance as a protection against any exceptionally heavy potential loss due to a disastrous occurrence. In the very nature of our business we handle large quantities of explosives and from this standpoint alone it will be realized that the chance of a serious mishap exists.

As the result of the carrying of our own compensation risk we have effected a saving of somewhat more than fifty per cent of what purchased coverage would have cost us. In this calculation we have included actual compensation and medical payments and reserves and the cost of excess insurance and administration of our safety program. Besides the financial saving thus effected, we believe that the administration by ourselves of our workmen's compensation has fostered a closer relationship between the company and its employees through the closer contact in the handling of compensation matters and the more intimate relation in following up injury cases among our men. This more personal contact with the injured men by a representative of our company, rather than by an outside party, who is a stranger to the claimant, we believe tends toward a better understanding between employer and employe, largely through the greater personal interest shown and the probably more liberal expenditure for medical, surgical and hospital services, which may result in the quicker rehabilitation of the injured employe and his consequent earlier return to work.

In conclusion, we feel that the reduction of accidents in our company has been the result of the sincere and continued interest of our executives, the careful planning of our accident prevention work, and getting the workmen at our plants to cooperate with us in the prosecution of our program, which is in their interest as well as that of our company.

BUY BONDS!

The Postwar Outlook for Business and Labor[1]

By SUMNER H. SLICHTER

Lamont Professor of Economics, Harvard University, and Chairman of the Research Advisory Board, Committee for Economic Development.

• **A summary forecast of probable trends, during the transition and immediate postwar period, in employment, savings, and investment, and the demand for consumer and capital goods.**

WITHIN two years after the end of fighting, federal expenditures will drop from about $90,000,000,000 to $25,000,000,000 a year. This will represent the greatest and swiftest disappearance of markets in all history. Within a year after the fighting, eight or nine million men will leave the Armed Service, two million will leave the civilian government jobs, and five million will be laid off by plants making combat munitions. Of thirteen million additional men making war goods, perhaps half will be laid off. Some of these soldiers, sailors, and workers will leave the labor market altogether, but nearly twenty million of them will be looking for jobs—not, necessarily, all at once, but within a year after the firing ceases. Is there any chance that this large and sudden collapse in demand will fail to plunge the country into a depression worse than that of 1933?

Let us look at the other side of the picture. We shall be living in a world of superlatives—a world of record-breaking "high" and "lows." When the war ends, the accumulated needs of American consumers and American business enterprises will also be at all-time highs.

Back in 1941, with six million people unemployed, Americans were driving 29 million automobiles, but by the end of 1944 the number of automobiles will be down to 23 million or less. If, by any chance, employment after the war is higher than in 1940, Americans will wish to drive considerably more than 29 million automobiles—probably 33 million or 34 million.

There are over six hundred articles of iron and steel that have not been made for civilian use since early in 1942. Most durable household goods, for example, have not been made since 1942. It is reasonable to estimate that, by the end of the war (say, in 1945 or 1946) the accumulation of deferred demand will be equal to two years' sales at the 1940 rate. This is a conservative estimate because in 1940 an average of about 7 million persons were unemployed.

This estimate indicates the following volumes of accumulated demand:

Vacuum Cleaners	3.5 million
Clocks	7.2 million
Radio Receivers	23.0 million
Refrigerators	5.2 million
Electric Irons	10.3 million
Washing Machines	3.1 million
Waffle Irons	1.5 million
Heating Pads	1.8 million
Percolators	3.7 million
Toasters	4.5 million

The annual increase in the number of families in the United States is about 550,000. If every house lasted forever, we should need about 550,000 new dwelling units each year to provide for the increase in families. In 1942, the number of permanent dwelling units constructed was 358,000; in 1943, it was still less; and in 1944 it will be even less than in 1943. By the end of 1944 there will be a deficiency of at least 750,000 in the number of permanent dwelling units constructed since Pearl Harbor.

The normal number of marriages in the United States is about 1,400,000 a year. The number of marriages varies with business conditions, and one can judge the state of business simply by plotting year by year the number of marriages on a chart. In 1932, the number of marriages fell to 982,000. In 1940, it was 1,565,000, or 165,000 above normal; in 1941, it was 1,616,000, or 216,000 above normal; and in 1942, it was 1,800,000, and in 1943, 1,750,000. At present there are about 1,200,000 more married couples in the United States than there would have been had the war not occurred. In 1944, the number of marriages may sink down to normal or even below normal, and it may be below normal in 1945. If the war ends by 1946, the number of families will be 800,000 to 1,000,000 greater than it would have been had the war not occurred. A high proportion of the 7,000,000 couples who have been married during the last four

[1] A speech delivered before the 1944 Annual Meeting of The Committee for Economic Development, Blackstone Hotel, Chicago, July 13, 1944.

years have not set up housekeeping and have purchased little furniture, rugs, and household equipment. The greatest marriage year in human history was 1920. In all countries of Europe and in the United States, the number of marriages reached a new high. This was true regardless of whether the country was in the war or not, regardless of whether it was on the winning or losing side, regardless of whether or not it was experiencing extreme inflation. About a year after the service men are demobilized, marriages in the United States will reach another peak. It seems certain that the accumulated need for household goods, after the war, will reach new highs.

Great and pressing needs for goods do not necessarily mean demand. That requires purchasing power. During the last three years individuals have been compelled, by the sheer scarcity of consumer goods, to save over $75,000,000,000. But even though prices have risen, individual incomes have been so large that they exceeded, at current prices, the supply of consumer goods by $75,000,000,000. During the last three years individuals have saved as much as they would have saved in ten years at the 1940 rate. Before the end of the war the increase in the savings of the individuals will be equal to fifteen years' saving at the 1940 rate. At present the liquid assets of individuals (that is their holdings of cash, demand deposits, time deposits, and war savings bonds) are twice their holdings than at the end of 1940.

Business enterprises have also greatly increased their liquid assets. Although the tax liabilities of corporations increased nearly $15 billion between 1939 and 1943, their holdings of cash, bank deposits, and government securities increased by $25.5 billion and their net working capital by $17.0 billion.

No one really knows whether business immediately after the war is going to be good or bad. The greatest and quickest disappearance of markets in all history is going to hit a community which has a far greater accumulation of needs and a far larger accumulation of purchasing power than have ever before existed. Perhaps men will refuse to use their record-breaking holdings of purchasing power to satisfy their huge accumulated needs. Never before, however, have people who are well supplied with purchasing power been unwilling to use it to feed and clothe themselves and to provide themselves shelter, education, travel, and amusement. If a great and prolonged depression follows the war in the United States, it will be because people who have more money and liquid assets than they have ever owned are unwilling to use it to satisfy their needs.

Let us suppose that 57,000,000 people are working after the war, and that they are working about 7.5 percent fewer hours per week than they are working today. This would be a short enough working week to eliminate most of the over-time payments. Many people would be working in occupations where the product of an hour's work has a smaller value than the product of an hour's work in war industries today. At 1943 prices and at present efficiency, the output of 57,000,000 people would be about $156,000,000,000 a year. The national, state and local governments will take about $31,000,000,000 of this product, leaving $125,000,000,000 available for private consumption.

The income of 57,000,000 persons working 7.5 percent fewer hours per week than in 1943 would be about $130,000,000,000. After the payment of personal taxes, they would have about $118,000,000,000 to spend on goods, or to save.

How much of this would they spend on goods? Let us begin by asking about non-durable goods. How much more would you have spent on beefsteaks, milk, butter, cheese, gasoline, tires, in 1943 if these goods had been available? How much more would you have spent on railroad travel and on hotel accommodations if you had had time to take vacations or if accommodations had been available? How much more would you have spent on painting your house, or getting your house or its contents repaired, if labor had been available? As a conservative estimate, I have assumed that the demand for non-durable goods in 1943 would have been 10 percent more than it actually was. Adjusting this rate of spending to a disposable income of $118,000,000,000 indicates a postwar demand for non-durable goods just short of $90,000,000,000—$89.8 billion.

The demand for durable goods may be put at 12 percent of disposable income. This is the fraction of disposable income which consumers spend for durable goods in fairly prosperous years. This would make a demand for durable goods at $14.2 billion —just double the dollar demand of 1940 and perhaps 40 percent above the physical demand of 1940. This takes no account of the "catching up" demand for durable goods. In physical terms, this may be placed at double the demand for 1940. In terms of 1943 prices, the "catching up" demand would be about $17.8 million. If the "catching up" demand for durable goods were spread over four years, it would average $4.4 billion a year. All of this indicates a total postwar demand for consumer goods, at 1943

prices, of roughly $106.4 billion. For the first time in the history of the country the demand for consumer goods will exceed $100,000,000,000 a year. If consumers buy $106.4 billion of goods and if government expenditures leave $125 billion for private use, there will remain about $18.6 billion of goods to meet the demands of business.

What are likely to be the demands of business? The replacement of equipment will be large. It is likely to run 1½ times corporate depreciation allowances, or about $12,000,000,000. Industrial construction, for a while, may be expected to be small, because business enterprises will await the clarification of economic trends before making long-term plans. In physical volume, industrial construction for a while may be no higher than in 1939. At 1943 prices it would be about $4,000,000,000 a year. The restoration of inventories will take about $3,000,000,000 a year for three years. The demand for housing may be held down for a year or two because people will await clarification of economic conditions before starting to build. At any rate, let us hope that it is slow to rise. If it is no greater in physical volume than the low level of 1939, it will be about $2.6 billion in 1943 prices. Temporarily, at least, a considerable export surplus may be expected over and above contributions made by our government to other countries which are included in the purchase of goods by the government. If we succeed in keeping the export surplus down to a smaller physical volume than after the first world war, it may be no more than $3,000,000,000 a year. All of this comes to a business and residential building demand of about $22.5 billion a year. In other words, with 57,000,000 people working about 7.5 percent fewer hours per week at present efficiency, the output of goods would fall short by a small margin of meeting the probable demand. With a moderate improvement in efficiency, however, the demand would be met.

The conclusion is that the postwar demand for goods is likely for a year or two or more to test the productive capacity of American industry, but that business enterprises, with moderate improvements in efficiency, should be able to prevent a disorderly rise in prices from being started by an excess of demand. This does not mean that a disorderly rise in prices might not start from the side of costs—by failure of management to keep costs properly under control. Attention should be called to the fact that my assumptions concerning the demand for residential construction and industrial construction are low—too low, undoubtedly, to suit many persons and far too low to last.

After the war the country will not go through simply one transition—the transition from war to peace. On the contrary, it will go through a succession of transitions. Indeed, the first decade after the war will be punctuated by transitions. Suppose, for example, that with 57,000,000 people at work we wished to own and drive 34,000,000 automobiles. This would require an increase of 11,000,000 or more in the number of cars which we are likely to have on hand when fighting ceases. Suppose that in about four years after the war we bring up the number of automobiles to the number demanded, so that output need meet only replacements and the normal increase in demand. At that time the country is likely to face an "air pocket" in the demand for automobiles, unless the industry makes such radical improvements in cars that the replacement rate takes a sharp jump. Similar "air pockets" in the demand for many other durable consumer goods may occur two or three years after the end of fighting. The surplus of exports over imports will probably prove temporary—indeed, it *must* prove temporary unless we are to play Santa Claus to the rest of the world.

It seems plain that the first decade after the war will be a period of major shifts in demand—a period in which economic stability will depend upon our success in offsetting decreases in demand for some products with increases in demand for other products. Stability will require that business policies and national economic policies reflect much common sense, foresight, and self-control. Stability will require that the economy be equipped with powerful stabilizing devices to prevent disorderly rises in prices and speculative buying on the one hand and, on the other hand, to prevent "air pockets" in demand from producing cumulative increases in unemployment.

As the accumulated demand for durable consumer goods, goods for inventories, and industrial equipment subsides, we must depend for stability upon a rise in demand for industrial construction and residential building. Given sensible tax policies, the potential demand here is likely to be very large. An investment of about $2.00 in factories, mines, railroads, public utilities, stores, office buildings, and inventories seems to be required for every dollar of goods produced for consumers per year. If annual consumer demand rises in terms of 1943 dollars by about $35,000,000,000, we shall need to increase our industrial plant, equipment, and inventories, in the

first five or ten years after the war by possibly $70,000,000,000.

Certainly with 57,000,000 people working and spending their incomes, most large cities will need some new hotels. People are not going to line up, as they do now, for rooms, and eventually sleep in sample rooms. Chicago would need at least one large and up-to-date new hotel. And people will not line up in restaurants as they now must do. Hundreds of good restaurants will be needed, much railroad equipment, thousands of taxicabs.

The present high levels of factory employment have been achieved only by working many people nights. With 57,000,000 people employed after the war, the number of non-government jobs will be 3 million more than it now is. These people will need places to work and machines to run. In most industries they will not be content to get employment opportunities by working nights, and employers will not be disposed to pay night-shift premiums if the demand for goods seems to be fairly permanent. Hence, a large volume of factory construction will be needed. Furthermore, in competition with modern one-story factories, many old multiple-story factories will be obsolete.

The demand for housing should also be large. Most of this demand comes from families receiving $2,000 a year or more. In 1925, our best housing year, families receiving $2,000 a year or more spent slightly more than 12 cents out of each dollar of income on new housing. With disposable incomes of $118,000,000,000, families receiving $2,000 a year or more would have total incomes of $80,000,000,000 or more. If these families spent 12 cents out of every dollar after taxes for housing, as they did in the middle of the twenties, the annual demand for housing should run nearly $10,000,000,000 a year.

These are simply some of the potentialities outlined in broad strokes. They indicate that high level employment is easily within the range of practical achievement. They indicate also that shifts in demand may be large and even sudden, and that stability in total demand, production, and employment will be achieved only by wise planning. If industry, labor, and the government do a good job, however, income payments to individuals should rise (on 1943 prices) from $130,000,000,000 shortly after the war to $150,000,000,000 by 1950, to $182,000,000,000 by 1960, and to $217,000,000,000 or more by 1970. These figures assume an increase of only 15 percent per capita per decade—a much smaller increase per capita than during the twenties or during previous decades. Let us keep clearly before us these great potentialities of our economy. Awareness of them will help us keep our sights high; it will stimulate our confidence in our power to achieve; it will help us retain and develop the spirit of pioneering and innovation.

William Hartley Lindsay

1896-1944

IT IS with sincere regret and a deep sense of loss that we report the death of William Hartley Lindsay, General Manager and Secretary-Treasurer of Canada Crushed Stone, Ltd., a member of the Board of Directors of the National Crushed Stone Association since his election to that body in 1942, to replace the late C. M. Doolittle.

Loved by those who knew him intimately and heartily liked by all of those who had contact with him, Hartley Lindsay will be greatly missed by his wide circle of friends and business acquaintances. Particularly will his loss be keenly felt by the Canada Crushed Stone, Ltd., which organization he served so ably for twenty years.

Mr. Lindsay was first taken ill about a year ago, but recovered sufficiently to return to his office until he suffered a relapse about two months prior to his death. He took a prominent part in Masonic activities and was shortly to have been made a 33° Mason, the highest honor which can be awarded any member of the craft.

Mr. Lindsay never married and is survived by his parents; a brother, Winston M. Lindsay; and a sister, Miss Eleanor Marguerite Lindsay.

Our heartfelt sympathy is extended to his family and business associates in their bereavement.

When, Where and How to Sell Safety

By W. M. POWELL

**Safety Director,
Medusa Portland Cement Co.,
Cleveland, Ohio**

• As News Letter Editor of the Cement and Quarry Section of the National Safety Council, Mr. Powell wrote the following editorial which appeared in the September issue of the News Letter. He speaks from a background rich in practical experience and on a subject of most timely interest.

WHEN you were doing the job of hiring a man, or a group of men, did you ever try to imagine what was going on in their minds? It shouldn't be difficult to do. Just go back to the time when you sought a job yourself.

"What kind of an outfit is this? I wonder if everybody in the plant is an old sour puss like this dodo. If they are, I don't give a hoot whether I land this job or not. I'm sorry I hit this joint. Might have done better at Blank's."

Of course, if you are a sour puss, that's just about what those prospective employees are thinking while waiting to be interviewed.

On the other hand, if you find a group of men (and it will not be too far off either) waiting to ask you about a job one of these mornings, if you should greet them with a smile instead of passing them by, like a pay car passing a tramp, their reactions will be just the reverse of the first group. They will feel sure that they have come to the right place to find work in agreeable and friendly surroundings.

From long experience, I would never hire a man until I had checked with his former employer, unless I knew him personally. No one should be put to work until he has been certified by the doctor as able to do the work for which he applies. This same practice should be followed when transferring employees from one department to another, unless you are certain that there is not sufficient difference in the physical requirements for both jobs. Reference should be made to the P.X. before making a transfer.

My first approach would be to greet the applicants in a friendly manner and engage them in impersonal conversation for a few minutes to erase any fears they might have about my attitude toward applicants. I would then tell them that necessary references from former employers must be furnished before we would consider them. If the prospective employee is the right sort, he will offer no objection to this. If he does, I would not want him on my pay roll.

It might be possible to contact the former employer by phone in emergencies, if he is close enough. If not, by mail within a few days. It may be argued here that the employee is urgently needed. But, the come-back is that no man is indispensable. Suppose the prospect should change his mind and decide he didn't want to work for you?

The new employee should submit to a physical examination. Its purpose is not to see if something can be found to bar him from the job but to make sure that he is physically able to do the work without danger of injury.

After receiving the doctor's O. K. he should then be "given the works" with reference to safety, his own and his fellow employees, and the part he must play in the plant organization. It is not enough merely to tell him to "be careful." You must tell him what to be careful of and why. Explain that it is impossible for you to cover every detail of the safety features of every job and every department of the plant but that you are giving him a general idea of what safety means to him in his new job. Explain the policy of the company with reference to welfare, vacations, the union, if any. If a maintenance of membership clause is a part of your contract with the union, explain that to him. Be sure he understands the rate he is to receive and how he can be promoted to better jobs with better pay, provided he can qualify.

The time spent in talking things over with the prospect, be the hiring done by the superintendent, his assistant, or the safety engineer, or whoever is detailed to do the hiring, is time well invested, as you will discover.

The new man should be taken to his foreman and introduced as a mutual friend. In making the introduction you might tell the foreman to be sure that the new member of the family understands his job thoroughly. Tell the new man that if he doesn't understand any detail about it, he is not to take any chances but should seek his foreman or ask an older man, an experienced man, for information. The foreman should, in turn, make him acquainted with the other men in his department and tell them, in his presence, to help him in any way they can to do his work safely.

His foreman should explain about punching the clock, show him where it is and where the conveniences, toilet and bathing are located. Assign him a locker, tell him where the first aid service is and the importance of first aid for all injuries, particularly the seemingly insignificant ones. Also tell him about the personal safety devices such as goggles, helmets, respirators, etc., that he may be required to wear on occasion and the care he should give them.

In plain English, apply the Golden Rule to your treatment of the new employee. Superintendent, assistant, foreman and others in any official capacity, treat him as you would wish to be treated if you were in his place. He should meet the timekeeper, chief clerk and others with whom he will come in contact. Finally, ask him if there is anything he would like to ask you, that you want to be sure he is getting off on the right foot. Tell him to come to you, with any of his troubles, real or fancied, and you will talk them over with him and endeavor to get him straightened out. (If you don't someone else will). Be a friend to him and he will be your friend.

This might sound like a pipe dream but it is as real as you make it and it will pay you in proportion to the time and sincerity you put into it. I know because I have worked it.

When you buy a new piece of machinery do you take the first one that is suggested or do you have several conferences with the powers that be about it. Sometimes if you know of one within several hundred miles, you spend the money and take the time to see it perform; you satisfy yourself that that machine is the one you want.

Then when you buy and install it, do you forget about it until it breaks down from lack of attention? No indeed, you sometimes get a special oil or grease or both to insure its running smoothly and you watch closely to see that it does all that is expected. You also send to the purchasing department reports on its performance. If it has a certain rating you are careful not to overload for fear that it might develop a "hernia."

Do you show that man you hired the same consideration as you do the machine? That machine cost you a great many dollars. What did you pay for that man? You can duplicate the machine for a large sum of money, if it should break down and the manufacturer would be happy to sell you another one but how about the man? True, you could hire another if this one were wrecked. He would do just as good work or perhaps better than the one he replaced but what about the family of the wrecked man and his place in the great plan of life? Could you replace him in the hearts of his loved ones? You know the answer to that one as well as I do, even though you may not have had a loved one taken from you suddenly by an accident.

If it is important enough to go through all that performance when you need a new machine, isn't it just as important or more so to spend at least a part of the time you spent on the machine, on the hiring and follow-up of a human being? You know the answer to that one too. Then why not try it for a while? You will find that it will pay you even greater dividends, not only in cash but in good will, friendship, the respect of your employees and what is more, the feeling of self-satisfaction every good man has when he does his fellow man a real service. If you want a friend, you must be one. Try some of that special oil and grease on the next man you hire. Use it as liberally on the man as you do on the machine and you will get more for your money every time.

First impressions are the ones remembered longest and with the kindliest feelings or with bitterness, depending on which they were. Sell yourself, sell your company and by reflecting the safety attitude of your company and yourself, sell the new man on safety when you make your first contact with him. You can never jam it down his neck and make him like it. First, you must believe in it and your company officials must believe in and live it before you can sell it to anyone. If you have a set-up like that and put this hiring technique into practice, your accident frequency and severity are bound to come down.

IMPORTANT NOTICE

The Post Office Department has directed that henceforth zone numbers be used on all mail addressed to the city of Washington.

Our offices are located in Zone 9 and we would appreciate your addressing any future correspondence to us in the following manner:

NATIONAL CRUSHED STONE ASSOCIATION
1735 14th Street, N. W.
Washington 9, D. C.

Your cooperation in this matter will be greatly appreciated.

MANUFACTURERS' DIVISION

of the

NATIONAL CRUSHED STONE ASSOCIATION

These associate members are morally and financially aiding the Association in its efforts to protect and advance the interests of the crushed stone industry. Please give them favorable consideration whenever possible.

Allis-Chalmers Mfg. Co.
Milwaukee, Wis.
Crushing, Screening, Washing, Grinding, Cement Machinery; Motors; Texrope Drives; Centrifugal Pumps; Tractors

American Cyanamid & Chemical Corp.
Explosives Department
30 Rockefeller Plaza, New York, N. Y.
Explosives and Blasting Supplies

American Manganese Steel Division of American Brake Shoe Company
389 East 14th St., Chicago Heights, Ill.
Manganese Steel Castings, Power Shovel Dippers, Material Handling Pumps, Heat and Corrosion Resistant Castings, Reclamation and Hard-Facing Welding Materials

The American Pulverizer Co.
1249 Macklind Ave., St. Louis, Mo.
Manufacturers of Ring Crushers and Hammermills for Primary and Secondary Crushing

Atlanta Truck and Tractor Company
P. O. Box 4102, Atlanta, Ga.

Atlas Powder Co.
Wilmington, Del.
Industrial Explosives and Blasting Supplies

Earle C. Bacon, Inc.
17 John St., New York City
Primary and Secondary Crushers, Rolls, Screens, Elevators, Conveyors—Complete Plants designed and equipped

Barber-Greene Company
Aurora, Illinois
Portable and Permanent Belt Conveyors, Belt Conveyor, Idlers, Bucket Loaders both Wheel and Crawler Mounted, Asphalt Mixers and Finishers, Coal Handling Machines

Brooks Equipment and Mfg. Co.
408-10 Davenport Road, Knoxville, Tenn.
"Brooks Load Lugger" (Stone Hauling Equipment). DAY Jaw Type Rock Crushers. DAY Pulverizers, or "Swing Hammer" Crushers

C. G. Buchanan Crushing Machinery Division of the Birdsboro Steel Foundry and Machine Co.
1941 Furnace St., Birdsboro, Pa.
Primary, Secondary and Finishing Crushers and Rolls

Bucyrus-Erie Co.
South Milwaukee, Wis.
Excavating, Drilling and Material Handling Equipment

Cross Engineering Co.
Carbondale, Pa.
Screen Plates and Sections, Perforated Plate, for Vibrating, Rotary and Shaking Screens

Deister Machine Company
1933 East Wayne Street, Fort Wayne, Ind.
Deister Plat-O Vibrating Screen, Deister Compound Funnel Classifier

Diamond Iron Works, Inc.
Minneapolis, Minn.
Rock Crushing, Conveying and Transmission Machinery

E. I. du Pont de Nemours & Co., Inc.
Wilmington, Del.
Explosives and Blasting Accessories

Dymonhard Corporation of America
250 West 57th St., New York City
Hard Facing Welding Rods

Easton Car and Construction Co.
Easton, Pa.
Quarry Cars, Truck Bodies and Trailers Electric Heaters for Tar, Asphalt or Bitumen

Ensign-Bickford Co.
Simsbury, Conn.
Cordeau-Bickford Detonating Fuse and Safety Fuse

Frog, Switch & Mfg. Co.
Carlisle, Pa.
Manganese Steel Department—Manufacturers of "Indian Brand" Manganese Steel Castings for Frogs, Switches and Crossings, Jaw and Gyratory Crushers, Cement Mill, Mining Machinery, etc., Steam Shovel Parts

MANUFACTURERS' DIVISION of the NATIONAL CRUSHED STONE ASSOCIATION

General Electric Co.
1 River Road, Schenectady N. Y.
Electric Motors

Goodyear Tire & Rubber Co.
Akron, Ohio
Belting (Conveyor, Elevator, Transmission), Hose (Air, Water, Steam, Suction, Miscellaneous), Chute Lining (Rubber)

Gruendler Crusher and Pulverizer Co.
2915 N. Market St., St. Louis, Mo.
Rock and Gravel Crushing and Screening Plants, Jaw Crushers, Roll Crushers, Hammer Mills, Lime Pulverizers

Hayward Co.
50 Church Street, New York City
Orange Peel Buckets, Clam Shell Buckets, Drag Line Buckets, Electric Motor Buckets, Automatic Take-up Reels

Hendrick Mfg. Co.
Carbondale, Pa.
Perforated Metal Screens, Perforated Plates for Vibrating, Shaking and Revolving Screens; Elevator Buckets; Hendrick Vibrating Screens

Hercules Powder Co.
Wilmington, Del.
Explosives and Blasting Supplies

Illinois Powder Mfg. Co.
124 N. 4th St., St. Louis, Mo.
Gold Medal Explosives

Iowa Manufacturing Co.
Cedar Rapids, Iowa
Rock and Gravel Crushing, Screening, Conveying and Washing Plants, Hot and Cold Mix Asphalt Plants, Stabilizer Plants, KU-BIT Impact Breakers, Screens, Elevators, Conveyors, Portable and Stationary Equipment.

Kennedy-Van Saun Mfg. and Eng. Corp.
2 Park Ave., New York City
Material Handling Machinery—Crushers, Pulverizers, Vibrating Screens

Kensington Steel Co.
505 Kensington Ave., Chicago, Ill.
Manganese Steel Castings, Dipper Teeth, Crawler Treads, Jaw Plates, Concaves and Hammers

Keystone Driller Co.
Beaver Falls, Pa.
Drills, Power Shovels

The King Powder Co., Inc.
Cincinnati, Ohio
Detonite, Dynamites, and Blasting Supplies

Koehring Co.
3026 W. Concordia Ave., Milwaukee, Wis.
Mixers, Pavers, Shovels, Cranes, Draglines, Dumptors, Traildumps, Mud-Jacks

Kotal Company
52 Vanderbilt Ave., New York City
KOTAL, the Waterproofing Agent for Aggregates that Improves Hot Mixes, Cold Mixes, Traveling Plant Mixes and Road Mixes of Bitumen

Lima Locomotive Works, Inc.
Shovel and Crane Division
1108 Lima Trust Bldg., Lima, Ohio
Power Shovels, Draglines and Cranes

Link-Belt Co.
300 West Pershing Road, Chicago, Ill.
Complete Stone Preparation Plants. Conveyors, Elevators, Screens, Washing Equipment, Speed-o-Matic Shovels—Cranes—Draglines and Power Transmission Equipment

Ludlow-Saylor Wire Co.
Newstead Ave. & Wabash R. R., St. Louis, Mo.
Woven Wire Screens and Wire Cloth of Super-Loy, Manga-Loy and all commercial alloys and metals

Mack Manufacturing Corp.
34st St. & 48th Ave., Long Island City, N. Y.
Trucks, Truck-Tractors of All Types and Capacity, Gasoline or Diesel Power Optional

Maguire Industries, Incorporated
Nostrip Division
2010 Broadway, New York 23, N. Y.
Nostrip, Roctreet

Marion Steam Shovel Co.
Marion, Ohio
A Complete Line of Power Shovels, Draglines and Cranes

McLanahan & Stone Corp.
Hollidaysburg, Pa.
Complete Pit, Mine and Quarry Equipment —Crushers, Washers, Screens, Feeders, etc.

MANUFACTURERS' DIVISION of the NATIONAL CRUSHED STONE ASSOCIATION

The National Supply Co., Superior Engine Division
1401 Sheridan Ave., Springfield, Ohio
Diesel Engine Equipment

New Holland Machine Co.
New Holland, Pa.
Limestone Pulverizers; Jaw, Roll, and Hammer Crushers; Elevators; Revolving and Vibrating Screens; Dewaterers; Belt and Apron Conveyors; Conveyor Belting; V-Belts; V-Belt Drives; Engines; Electric Motors; Concrete Mixers with or without Power Lifts

Nordberg Mfg. Co.
Milwaukee, Wis.
Cone Crushers, Vibrating Screens, Diesel Engines, Steam Engines, Compressors, Mine Hoists, Underground Shovels, Track Maintenance Tools

Northern Blower Co.
65th St. South of Denison, Cleveland, Ohio
Dust Collecting Systems, Fans—Exhaust and Blowers

Northwest Engineering Co.
28 E. Jackson Blvd., Chicago, Ill.
Shovels, Cranes, Draglines, Pullshovels

Parsons Engineering Corp.
3599 E. 82d St., Cleveland, Ohio
Dust Collecting Systems: Fans, Hoods and Blow Piping

Pioneer Engineering Works, Inc.
1515 Central Avenue, Minneapolis, Minn.
Jaw and Roll Crushers, Vibrating and Revolving Screens, Scrubbers, Belt Conveyors, Traveling Grizzley Feeder

Pit and Quarry Publications
538 South Clark St., Chicago, Ill.
Pit and Quarry, Pit and Quarry Handbook, Pit and Quarry Directory, Concrete Manufacturer, Concrete Industries Yearbook

Robins Conveyors Incorporated
270 Passaic Avenue, Passaic, N. J.
Belt Conveyors, Bucket Elevators, Gyrex and Vibrex Screens, Feeders, Design and Construction of Complete Plants

Rock Products
309 West Jackson Blvd., Chicago, Ill.

Ross Screen and Feeder Co.
19 Rector St., New York City
Ross Patent Chain Feeders for Feed Control of All Sizes Rock, Ores, Gravel, etc.

Sanderson-Cyclone Drill Company
South Main St., Orrville, Ohio
Complete line of all steel drills

Screen Equipment Co.
9 Lafayette Ave., Buffalo, N. Y.
SECO Vibrating Screens

Simplicity Engineering Co.
Durand, Mich.
Simplicity Gyrating Screen, Simplicity D'centegrator, Simplicity D'watering Wheel

Smith Engineering Works
E. Capitol Drive at N. Holton Ave.,
Milwaukee, Wis.
Gyratory, Gyrasphere, Jaw and Roll Crushers, Vibrating and Rotary Screens, Gravel Washing and Sand Settling Equipment, Elevators and Conveyors, Feeders, Bin Gates, and Portable Crushing and Screening Plants

Stedman's Foundry & Machine Works
Aurora, Indiana
Stedman Impact-Type Selective Reduction Crushers, 2-Stage Swing Hammer Limestone Pulverizers

Stephens-Adamson Mfg. Co.
Aurora, Ill.
Belt Conveyors, Elevators, Feeders, Car Pullers, Screens, Skip Hoists, Complete Plants

Taylor-Wharton Iron & Steel Co.
High Bridge, N. J.
Manganese and other Special Alloy Steel Castings

The Texas Co.
135 E. 42nd St., New York City
Asphalts, Lubricating and Fuel Oils

The Thew Shovel Co.
Lorain, Ohio
Power Shovels, Cranes, Crawler Cranes, Locomotive Cranes, Draglines. Diesel Electric, Gasoline. 3/8 to 2-1/2 cu. yd. capacities

The Traylor Engineering & Mfg. Co.
Allentown, Pa.
Stone Crushing, Gravel, Lime and Cement Machinery

Trojan Powder Co.
17 N. 7th St., Allentown, Pa.
Explosives and Blasting Supplies

The W. S. Tyler Co.
3615 Superior Ave., N. E., Cleveland, Ohio
Wire Screens, Screening Machinery, Scrubbers, Testing Sieves and Dryers